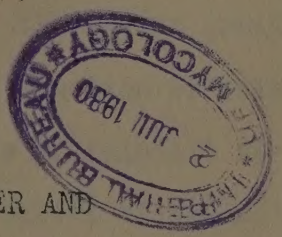
C 1 A

CONFERENCE OF EMPIRE METEOROLOGISTS, 1929.

AGRICULTURAL SECTION.



NOTE ON THE RELATION BETWEEN WEATHER AND CROPS.

by

A. Walter.

NOTE ON THE RELATION BETWEEN WEATHER AND CROPS.

A. Walter.

One of the greatest of the difficulties which present themselves to the research worker, who investigates the relation between crops and weather, lies in the determination and elimination of the non-effective changes in the elements which form the subject of the usual meteorological observations.

It is abundantly evident that plant growth cannot be represented as a linear or simple function of rainfall or temperature or wind. In the case of rainfall it is essential that its effect on the moisture content of the soil, to a depth available for plant utilisation, should be determined and the rainfall shewn as a function of soil moisture; an attempt was made to do this in a pamphlet on crops and weather published as one of the Miscellaneous Publications of the Mauritius Observatory.

In the case of temperature, neither the mean daily temperature nor the daily range of temperature is a sufficient indication of the effect of heat on plant growth.

In the Highlands of East Africa the phenomenon of plants of tropical and temperate climates, respectively, growing side by side is not infrequently seen and this appears to be due, in great measure, to the nature of the diurnal change of temperature and to the accumulated temperatures above or below a critical point.

In the case of wind the effect on plant growth is evidently a function, not only of the age of the plant, but of the duration of high velocities and the change of direction during the period of specified wind velocities. None of these factors

is made available for the research worker in the records of the various Observatories as usually published.

A further matter for consideration is the form which observations of solar radiation should take. The three instruments of a standard pattern are the Callendar, the Gorczynski and the Angstrom. The two former are designed to record the radiation received on a horizontal surface; the latter on a surface normal to the sun's rays.

None of them, as generally used, determines the intensity of different parts of the spectrum and yet it is believed that the predominance of specified parts of the spectrum plays an important part in plant and animal life in the Tropics. This may not be so apparent in Temperate climates but in the Tropics, and especially in East Africa at the present time, a systematic search is being made for the causes of the various effects produced by residence in these regions.

Demands are frequently made for observations of this nature. The effect of the sun's rays, of altitude, and of the considerable diurnal changes in the meteorological elements are being studied and the new service will be expected to play its part.

It would be extremely helpful to obtain the views of the other Directors of the Services and of the Agricultural section on the form of instrument to be adopted.

In dealing with the relation between weather and crops with a view to securing results of value to the practical farmer,

it

it appears advisable to establish observing stations in localities in which the crop to be examined is cultivated on a sufficiently large area and under commercial conditions. Most estates interested in the problem are willing to set apart such an area for this purpose and to maintain a uniform system of cultivation. The most advantageous area has not yet been decided upon. The small experimental plots used for growth tests under different cultural conditions are not in my opinion suitable and wherever possible I endeavour to secure two or three acres. It is important that a sufficient area should be used without placing an undue demand on the farmer.